

**Claims** (This listing of claims replaces all prior versions and listings of claims in the application.)

1. (Currently Amended C) A computer implemented method for emulating execution of legacy instructions including legacy instructions with self-modifying code, where said legacy instructions have instruction addresses, comprising:

accessing blocks of said legacy instructions, said blocks having block addresses,  
storing translations, into a translation store, for each of the legacy instructions,  
storing translation indications, for indicating translated blocks, into an indexing table at  
block numbers determined by said block addresses, said storing translation indica-  
tions using a subset of block address digits whereby block numbers in said table are  
the same for multiple different blocks,

~~executing translated instructions to emulate said legacy instructions,~~

where for each of the legacy instructions of a translated block having a block number in said  
table, said storing translations step includes translating the legacy instruction into  
one or more translated instructions for emulating the legacy instruction, and

if the legacy instruction is not a store instruction, going to ~~said~~ a step of exe-  
cuting translated instructions,

if the legacy instruction is a store instruction, where the store instruction  
stores to a particular block with a particular block number in said ta-  
ble, checking the indications in said table for the particular block  
number, and,

if the indications indicate that said particular block has not  
been translated to cause code modification, going di-  
rectly to said step of executing translated instructions,

if the indications indicate that said particular block has been  
translated so as possibly to cause code modification,  
checking said translation store to determine if ~~legacy~~

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~~instruction data~~ code has been modified and;  
if code has been modified, repeating the step of translating the legacy instructions and going to said step of executing translated instructions;  
and otherwise, if ~~legacy instruction data~~ code has not been modified, going to said step of executing translated instructions;  
executing translated instructions to emulate said legacy instructions.

2. (original) The method of Claim 1 wherein said step of storing translation indications stores indications for only a subset of all the translated blocks.
3. (original) The method of Claim 2 wherein said subset of all the translated blocks is stored in a cache.
4. (canceled).
5. (currently amended) The method of Claim 1 wherein said block address digits are included in a three digit hexadecimal address field and said subset of block address digits is the center digit.
6. (original) The method of Claim 1 wherein said legacy instructions are for a legacy system having a S/390 architecture.
7. (Previously Amended) The method of Claim 1 wherein said legacy instructions are object code instructions compiled/assembled for a legacy architecture.

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8. (original) The method of Claim 1 wherein said legacy instructions include store instructions for modifying instruction code.
9. (original) The method of Claim 1 wherein said translation indications include a state field for each block number indicating whether the block represented by said block number has been modified.
10. (Previously Amended) The method of Claim 1 wherein,  
said subset of all the translated blocks is stored in a cache,  
said translation indications include a state field storing a count for each block number indicating whether the block represented by said block number has been modified,  
said count in a state field is incremented each time a block represented by said block number has been modified in said cache,  
said count in a state field is decremented each time a block represented by said block number has been removed from said cache,  
said step of checking said translation store occurs only when said count is zero.

11. (Currently Amended C) A computer implemented method for dynamic emulation of object code legacy instructions including legacy instructions with self-modifying code, where the legacy instructions have instruction addresses determined by compilation/assembly of source code and where the legacy instructions include self-modifying store instructions for modifying instruction code, comprising:

accessing blocks of said legacy instructions, said blocks having block addresses,  
storing translations, into a translation store, for each of the legacy instructions,  
storing translation indications, for only a subset of all the translated blocks, into an indexing table at block numbers determined by said block addresses, said storing translation indications,

using a subset of block address digits whereby block numbers in said table  
are the same for multiple different blocks,

including a state field storing a count for each block number indicating  
whether the block represented by said block number has been modified by self-modifying store instructions,

~~executing translated instructions to emulate said legacy instructions,~~

where for each of the legacy instructions of said subset of all the translated blocks having a block number in said table,

said storing translations step includes translating the legacy instruction into  
one or more translated instructions for emulating the legacy instruction,

storing said translated instructions in a cache,

if the legacy instruction is not a store instruction, going to said a step of executing translated instructions,

if the legacy instruction is a store instruction, where the store instruction stores to a particular block with a particular block number in said table, checking the indications in said table for said particular block

number and,

if the indications indicate that said particular block number  
has not been translated to cause code modification,  
going directly to said step of executing translated in-  
structions,

if the indications indicate that said particular block number  
has been translated so as to possibly cause code modi-  
fication, checking said translation store to determine  
if ~~legacy instruction data~~ code has been modified and;  
if code has been modified, repeating the step of translat-  
ing the legacy instructions and going to said step  
of executing translated instructions;

and otherwise, if ~~instruction data~~ code has not been  
modified, going to said step of executing trans-  
lated instructions,

executing translated instructions to emulate said legacy instructions.

12. (Previously Amended) The method of Claim 11 wherein said count in a state field is incre-  
mented each time a block represented by said block number has been modified in said cache, said  
count in a state field is decremented each time a block represented by said block number has been  
removed from said cache, said step of checking said translation store occurs only when said count is  
zero.

13. (original) The method of Claim 11 wherein said legacy code is compiled/assembled for a na-  
tive architecture and executes as a guest on a host architecture.

14. (original) The method of Claim 13 wherein the native architecture employs CISC instructions and the host architecture employs RISC instructions.

15. (Currently Amended C) A computer system for emulating execution of legacy instructions including legacy instructions with self-modifying code, where said legacy instructions have instruction addresses, comprising:

a group access unit for accessing blocks of said legacy instructions, said blocks having block addresses,

a translator for translating the legacy instructions to form translated instructions,

a translation store for storing the translated instructions,

an execution unit for executing said translated instructions to emulate said legacy instructions,

an index table for storing translation indications for indicating translated blocks at block numbers determined by said block addresses, said index table storing translation indications using a subset of block address digits whereby block numbers in said table are the same for multiple different blocks,

where for each of the legacy instructions of a translated block having a block number in said table, said translation store includes one or more translated instructions for emulating the legacy instruction, and,

if the legacy instruction is not a store instruction, the computer system goes to the execution unit for executing said translated instructions,

if the legacy instruction is a store instruction, where the store instruction stores to a particular block with a particular block number in said table, the computer system checks the indications in said table for said particular block number and,

if the indications indicate that said particular block has not been translated to cause code modification, the

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computer system goes directly to the execution unit for executing said translated instructions, if the indications indicate that said particular block has ~~not~~ been translated so as possibly to cause code modification, said translation store is checked to determine if ~~instruction data~~ code has been modified and, if code has been modified, the translator repeats translating the legacy instructions and the computer system goes to the execution unit for executing said translated instructions; and otherwise, if ~~instruction data~~ code has not been modified, the computer system goes to the execution unit for executing said translated instructions.

16. (original) The system of Claim 15 wherein said index table stores indications for only a subset of all the translated blocks.

17. (original) The system of Claim 16 including a cache and wherein said subset of all the translated blocks is stored in said cache.

18. (canceled).

19. (Previously Amended) The system of Claim 15 wherein said block address digits are included in a three digit hexadecimal address field and said subset of block address digits is the center digit.

20. (original) The system of Claim 15 wherein said legacy instructions are for a legacy system having a S/390 architecture.
21. (original) The system of Claim 15 wherein said legacy instructions are object code instructions compiled/assembled for a legacy architecture.
22. (original) The system of Claim 15 wherein said legacy instructions include store instructions for modifying instruction code.
23. (original) The system of Claim 15 wherein said index table includes a state field for each block number indicating whether the block represented by said block number has been modified.
24. (Previously Amended) The system of Claim 15 wherein,  
said system includes a cache for storing said subset of all the translated blocks,  
said index table includes a state field storing a count for each block number indicating whether the block represented by said block number has been modified,  
said count in a state field is incremented each time a block represented by said block number has been modified in said cache,  
said count in a state field is decremented each time a block represented by said block number has been removed from said cache,  
said translation store is checked only when said count is zero.



25. (Currently Amended C) A computer system for dynamic emulation of object code legacy instructions, where the legacy instructions have instruction addresses determined by compilation/assembly of source code and where the legacy instructions include self-modifying store instructions for modifying instruction code, comprising:

a group access unit for accessing blocks of said legacy instructions, said blocks having block addresses,

a translation store for storing translation information for each of the legacy instructions,

an index table for storing translation indications, for only a subset of all the translated blocks at block numbers determined by said block addresses, said index table storing translation indications,

using a subset of block address digits whereby block numbers in said table are the same for multiple different blocks,

and including a state field storing a count for each block number indicating whether the block represented by said block number has been modified by self-modifying store instructions,

a cache for storing translated instructions,

an execution unit for executing said translated instructions to emulate said legacy instructions,

a legacy code translator operating, for each of the legacy instructions of said subset of all the translated blocks having a block number in said table,

to translate the legacy instruction into one or more translated instructions for emulating the legacy instruction,

to store said translated instructions in the cache and,

if the legacy instruction is not a store instruction, the computer system goes to said execution unit for executing said translated instructions,

if the legacy instruction is a store instruction, where the store instruction stores to a particular block with a particular block number in said ta-

ble, the computer system checks the indications in said table for said particular block number and,

if the indications indicate that said particular block has not been translated to cause code modification,

the computer system goes to said execution unit for executing said translated instructions,

if the indications indicate that said particular block has been translated so as to possibly cause code modification,

the computer system checks to determine if ~~instruction data~~ code has been modified;

and if code has been modified, the computer system

goes to said translator to repeat operating to translate the legacy instructions into one or more translated instructions and the computer system goes to said execution unit for executing said translated instructions;

and otherwise, if ~~instruction data~~ code has not been

modified, the computer system goes to ~~bypass said checking and go to~~ said execution unit for executing said translated instructions.

26. (Previously Amended) The system of Claim 25 wherein said count in a state field is incremented each time a block represented by said block number has been modified in said cache, said count in a state field is decremented each time a block represented by said block number has been removed from said cache, said bypass said checking occurs only when said count is zero.

27. (original) The system of Claim 25 wherein said legacy code is compiled/assembled for a native architecture and executes as a guest on a host architecture.

28. (original) The system of Claim 27 wherein the native architecture employs CISC instructions and the host architecture employs RISC instructions.